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Rock Wren (*Salpinctes obsoletus obsoletus*). One seen August 31; heard once or twice afterwards.

Western House Wren (*Troglodytes aedon parkmani*). Common but not very numerous. Last one seen September 15.

Western Gnatcatcher (*Poliophtila caerulea obscura*). The only one seen was taken September 25.

Western Bluebird (*Sialia mexicana occidentalis*). A complete family of Western Bluebirds lived in front of Camp Curry, but the species was seldom noted elsewhere. A small flock, in company with Audubon Warblers, was seen on September 20 near the foot-bridge west of Yosemite Village, but it did not stay long.

APPROXIMATE DATES OF DEPARTURES

Black-headed Grosbeak (*Zamelodia melanocephala*). None seen after September 20.

Lazuli Bunting (*Passerina amoena*). Very scarce toward the end of September; an immature taken September 28.

Western Warbling Vireo (*Vireosylva gilva swainsoni*). Numerous during latter part of August, but disappeared before middle of September.

Cassin Vireo (*Lanivireo solitarius cassini*). Numerous at first, gradually growing scarcer, but a few still in valley on September 28.

California Yellow Warbler (*Dendroica aestiva brewsteri*). Disappeared early in September.

Golden Pileolated Warbler (*Wilsonia pusilla chryseola*). Last noticed September 22.

Western House Wren (*Troglodytes aedon parkmani*). Last one seen September 15.
San Francisco, November 1, 1917.

A NOTE ON THE TRACHEAL AIR-SAC IN THE RUDDY DUCK

By ALEXANDER WETMORE

IN A PAPER published recently¹ the writer described a peculiar air-sac in the male Ruddy Duck (*Erismatura jamaicensis*) that was developed from the trachea, and was capable of inflation through a slit behind the larynx until it formed a pronounced swelling on the neck. The dissections on which these observations were based were made in the field in the summer of 1915, and during the following winter. Other observations on this peculiar development were made in the summer of 1916, but through the writer's absence in the field it was found impracticable to include them in the paper quoted, which was then in press.

On May 29, 1916, and on subsequent dates several adult Ruddy Ducks were captured alive in shallow ponds in the marshes at the mouth of Bear River, Utah. These ducks often were found in narrow channels that, though two feet deep or more, were barely wide enough to allow a boat to pass. As we came down these narrow runs the ducks swam on ahead until finally they came out into ponds where the water was not more than six or eight inches in depth. When closely pressed these birds chose to dive rather than attempt a laborious effort at flight. Under these conditions it was often possible to capture them alive and uninjured. In the clear water they could be seen swimming rapidly, both feet stroking vigorously together, with wings held close at the sides and the head turning quickly as they sought an avenue of escape.

On examining the males I was surprised to find that normally the tracheal

¹ On Certain Secondary Sexual Characters in the Male Ruddy Duck, *Erismatura jamaicensis* (Gmelin). Proc. U. S. Nat. Mus., vol. 52, Feb. 8, 1917, pp. 479-482.

air-sac was inflated, the distension varying from one-third full size to nearly two-thirds its complete capacity, according to circumstances. The air-sac lies between the trachea and the esophagus and could be felt with the fingers as a soft compressible bladder-like body that slipped about easily under the loose skin of the neck. In making the original dissections no sphincter muscle controlling the outflow of air was found, but it was supposed that the muscle *sterno-trachealis*, which is expanded over the air-sac, with the anterior angle of the expansion attached to the esophagus, "may close the aperture of the air-sac by pressing the esophagus against it." Observation of these living birds showed that this was true, and the contraction of this muscle was so strong that considerable manipulation was required to deflate the sac. I had supposed that the air-sac would always be deflated in diving, but this was not true in submersion to moderate depths at least. When birds were held under water it was possible at first to force out a small amount of air by compressing the air-sac between the fingers. This escaped by bubbles through the nostrils. Immediately, however, the muscle controlling the neck of the vesicle was contracted firmly, and a steady pressure of fifteen pounds or more on the sides of the air-sac failed to expel more of the air contained. It was possible however to deflate the sac completely by gentle manipulation with the fingers while the bird was not submerged. The process of re-inflation was slow, and was accomplished in three or four stages during an interval varying from one to three or four minutes in duration. There was no visible effort made by the bird during this process.

Examination of these living ducks substantiated the statement made that the tracheal air-sac was a secondary sexual character present in males but absent in females. Though the skin of the neck was full and loose in females there was no trace of a distended air-sac under it. Careful examination was made of several individuals in order to substantiate this point.

That male birds habitually keep this air-sac partly inflated even while diving is a strange fact as it might be supposed that the increased buoyancy would render it more difficult for them to stay submerged especially as the air reservoir is near the anterior end of the body. The only apparent use that it might have under these conditions is the questionable one of furnishing a reserve supply of air that might enable the bird to stay beneath the water for a longer period than normal. Need to utilize this, however, would not arise save under unusual circumstances.

Washington, D. C., October 21, 1917.

NOTES ON SOME BIRDS FROM CENTRAL ARIZONA

By H. S. SWARTH

(Contribution from the Museum of Vertebrate Zoology of the University of California)

DURING the summer of 1917 the writer spent several weeks in that portion of central Arizona traversed by the scenic highway known as "the Apache Trail", extending between Phoenix and Globe. The trip was undertaken at the instance of Mr. E. O. McCormick, vice-president of the Southern Pacific railroad, with the purpose of obtaining data for a popular account of the birds of the region. Specimens collected were, by agreement, placed in the collection